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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,127	07/15/2003	Marvin Glenn Wong	10020307-1	7853

7590 04/07/2004

AGILENT TECHNOLOGIES, INC.
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Intellectual Property Administration
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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/620,127

Applicant(s)

WONG ET AL.

Examiner

Ishwar (I. B.) Patel

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) 2 and 9-20 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1 and 3-8 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I and specie I, reading on figure 3, with the seam structure in wave like shape, claims 1 and 3-8, in Paper filed on March 19, 2004 is acknowledged.

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 2 and 9-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention / specie.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

(a) There is typographical mistake (letter missing) in the post office address of inventor #1.

(b) There are typographical mistakes (letters missing) in the name, residence address and post office address of inventor #2.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Goenka et al., US Patent No. 6,248,247.

Regarding claim 1, Goenka et al., discloses an air bridge (figure 3G) having:
one circuit component (element 35, figure 3G) on a substrate (element 60,
column 2, line 36 to 63, figure 3A-3G),
a crossover circuit trace (element 33, figure 3G) crossing over the circuit
component (column 2, line 35-63).

Though, the claim is drafted as Product-by-Process, it is the product / structure which is examined and the prior art applied accordingly.

Regarding claim 3, the applicant is claiming polynorbornene, as a sacrificial material used for forming the air bridge. However, using the sacrificial material and decomposing the same for forming the air bridge is a process limitation in a product claim. Such a process limitation defines the claimed invention over the prior art to the degree that it defines the product itself. A process limitation cannot serve to patentably

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distinguish the product over the prior art, in the case that the product is the same, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The circuit board of Goenka et al., has the same structure as claimed. Therefore, the claim is anticipated by Goenka.

Further, the sacrificial material is decomposed and will not be a part of the final structure.

Regarding claim 4, Goenka et al., further disclose the circuit components comprise a circuit trace (circuit trace 35, figure 4G, column 4, line 12-25).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goenka et al., as applied to claims 1, 3 and 4 above, and further in view of Middlehurst et al., US Patent No. 6,604,967 and Leigh et al., US Patent No. 5,986,893.

Regarding claim 5, the applicant is claiming the circuit trace comprises a signal trace.

Goenka et al., discloses both the elements 33 and 35 comprise circuit traces of the conductor network (column 4, line 12-26), however fails to explicitly disclose the said traces comprise a signal trace.

Middlehurst et al., discloses a circuit board 36, with plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (figure 1 and 2, column 3, line 35-45).

Leigh et al., discloses a printed circuit board 18 with signal trace 16 and power / ground traces 14 (figure 2b, column 3, line 63-67).

As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Further, as described in the disclosure information of Goenka et al., the air bridge cross over circuit facilitate high density circuits (column 1, line 56-58) and it would be obvious for a person of ordinary skill in the art to use the air bridge feature for any circuit traces, signal trace, ground trace or the power trace or for all of them to increase the density of the circuits.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit structure of Goenka et al., with the circuit component comprising a signal trace from the teaching of Middlehurst, Leigh and disclosure information of Goenka, in order to have a high density circuit board with the traces to transmit a signal.

Regarding claim 6, the applicant is claiming the circuit trace comprises a ground trace.

Goenka et al., discloses both the elements 33 and 35 comprise circuit traces of the conductor network (column 4, line 12-26), however fails to explicitly disclose the said traces comprise ground trace.

Middlehurst et al., discloses a circuit board 36, with plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (figure 1 and 2, column 35-45).

Leigh et al., discloses a printed circuit board 18 with signal trace 16 and power / ground traces 14 (figure 2b, column 3, line 63-67).

As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace as a ground trace for providing return path and shielding to the signal transmitted through the signal trace.

Further, as described in the disclosure information of Goenka et al., the air bridge cross over circuit facilitate high density circuits (column 1, line 56-58) and it would be obvious for a person of ordinary skill in the art to use the air bridge feature for any circuit traces, signal trace, ground trace or the power trace or for all of them to increase the density of the circuits.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit structure of Goenka et al., with the

circuit trace comprising a ground trace from the teaching of Middlehurst, Lehigh and disclosure information of Goenka, in order to provide a high density circuit with a ground trace to have a return path to the power and shielding to the signal transmitted through the signal traces.

Regarding claim 7, the applicant is claiming the circuit trace comprises a power trace.

Goenka et al., discloses both the elements 33 and 35 comprise circuit traces of the conductor network (column 4, line 12-26), however fails to explicitly disclose the said traces comprise a power trace.

Middlehurst et al., discloses a circuit board 36, with plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (figure 1 and 2, column 35-45).

Leigh et al., discloses a printed circuit board 18 with signal trace 16 and power / ground traces 14 (figure 2b, column 3, line 63-67).

As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace as a power trace for providing power to the circuits and other components.

Further, as described in the disclosure information of Goenka et al., the air bridge cross over circuit facilitate high density circuits (column 1, line 56-58) and it would be obvious for a person of ordinary skill in the art to use the air bridge feature for any circuit

traces, signal trace, ground trace or the power trace or for all of them to increase the density of the circuits.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit structure of Goenka et al., with circuit trace comprising a power trace from the teaching of Middlehurst, Lehigh and disclosure information of Goenka, in order to have high density circuit board with a power trace to provide power to the circuit and other components.

Regarding claim 8, the applicant is claiming the cross over circuit trace comprises a signal trace.

Goenka et al., discloses both the elements 33 and 35 comprise circuit traces of the conductor network (column 4, line 12-26), however fails to explicitly disclose the said cross over traces comprise signal trace.

Middlehurst et al., discloses a circuit board 36, with plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (figure 1 and 2, column 35-45).

Leigh et al., discloses a printed circuit board 18 with signal trace 16 and power / ground traces 14 (figure 2b, column 3, line 63-67).

As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Further, as described in the disclosure information of Goenka et al., the air bridge cross over circuit facilitate high density circuits (column 1, line 56-58) and it would be obvious for a person of ordinary skill in the art to use the air bridge feature for any circuit traces, signal trace, ground trace or the power trace or for all of them to increase the density of the circuits.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit board of Goenka et al., with the cross over circuit comprising a signal trace from the teaching of Middlehurst, Lehigh and disclosure information of Goenka, in order to have high density circuit board structure with a trace to transmit a signal.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chang et al., discloses an air gap formed by a sacrificial film layer 104 having a dissociation temperature between 300 degree C to 430 degree C, such as polynorbornene (column 2, line 43-52).

Grove discloses a structure with air gap using polynorbornene as sacrificial material 46 (column 2, line 37-45).

Lee discloses a conductive micro bridge structure.

Farrar discloses air bridge structure.

Akiyama discloses a printed circuit board with a conductor cross over structures.

Livshits et al., disclose a structure with two levels of wirings.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



I B Patel
Patent Examiner
GAU: 2827
April 4, 2004